

Biology	Group-I	Paper-II
Time: 1.45 Hours	(Subjective Type)	Max. Marks: 48

## (Part-I)

2. Write short answers to any FIVE (5) questions: (10)

(i) What are the effects of smoking on teeth?

**Ans** Smoking is responsible for weakening and staining the teeth. Tooth loss is 2 to 3 times higher in smokers than in non-smokers.

(ii) How sound is produced in voice box?

**Ans** Two pairs of fibrous bands called vocal cords are stretched across the larynx. The vocal cords vibrate when the air passes through them. This vibration produces sound.

(iii) What is the function of hairs and mucous in the nose?

**Ans** The function of hairs and mucous in the nose is to filter the dust particles from the air. The mucous also moistens and warms the incoming air and keeps its temperature nearly equal to that of the body.

(iv) What are the causes of stone formation in kidney?

**Ans** The major causes of kidney stones are age, diet (containing more green vegetables, salts, Vitamin C and D), recurring urinary tract infections, less intake of water and alcohol consumption.

(v) Define homeostasis. Give an example.

**Ans** Homeostasis may be defined as the maintenance of the internal conditions of body at equilibrium, despite changes in the external environment. For example, the core temperature of human body remains at about 37°C despite fluctuations in the surrounding air temperature.



**(vi) What are meninges? Write down their functions.**

**Ans** Three layers around the brain and the spinal cord are called meninges. These layers protect the brain and the spinal cord and provide them nutrient and oxygen through their capillaries.

**(vii) Write down the function of rods and cones present in the retina of eye.**

**Ans** The function of rods and cones is to generate nerve impulses in the optic nerve. These impulses are carried to the brain which makes the sensation of vision.

**(viii) How epilepsy can be treated?**

**Ans** There is no known cure of epilepsy but medicines can control seizures. Patients of epilepsy have to take medicines daily for the treatment as well as prevention of seizures. "These are termed as "anticonvulsant" or "antiepileptic" drugs.

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**3. Write short answers to any FIVE (5) questions: (10)**

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**(i) What two minerals are found in bones?**

**Ans** Following are the two minerals found in bones:

1. Calcium
2. Phosphate

**(ii) Differentiate between tendons and ligaments.**

**Ans** Tendons are tough bands and attach muscles to bones. When a muscle tendons exerts a pulling force on the attached bone, which moves as a result. Whereas ligaments are strong but flexible bands and join one bone to another at joints. They prevent dislocation of bones at joint.

**(iii) Define reproduction also write its importance for species.**

**Ans** Reproduction is define as "the production of individuals of the same species i.e., the next generation of species."

**Importance:**

Reproduction is thus essential for the continuation of species. It ensures that the genetic material of one



generation is transmitted to the next. In each generation, many individuals die due to various reasons before reaching the reproductive age and only the fittest and best survive to reach the productive age.

(iv) **What is micropyle? What is its use for seed?**

**Ans** Micropyle is the opening in ovule through which pollen tube enters. Seed uses it for the absorption of water.

(v) **What is meant by alternation of generations?**

**Ans** "The phenomenon in which two different generations alternate with each other during life cycle is known as alternation of generations.

(vi) **Differentiate between homozygous genotype and heterozygous genotype.**

**Ans** The genotype in which the gene pair contains two identical alleles (AA or aa), is called **homozygous** genotype.

The genotype in which the gene pair contains two different alleles (A a), is called **heterozygous** genotype.

(vii) **What is meant by co-dominance?**

**Ans** Co-dominance is the situation where two different alleles of a gene pair express themselves completely, instead of showing a dominant-recessive relationship. As a result, the heterozygous organism shows a phenotype that is different from both homozygous parents.

(viii) **What is theory of special creation?**

**Ans** The anti-evolution ideas support that all living things had been created in their current form for only a few thousand years ago. It is known as the "Theory of Special Creation."

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**4. Write short answers to any FIVE (5) questions: (10)**

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(i) **What is meant by decomposers? Give an example.**

**Ans** Decomposers mean organisms which decompose the dead bodies and dead matter. Many types of bacteria and fungi are the principal decomposers of biosphere.



(ii) Write down four disadvantages of excessive denitrification.

**Ans** Following are the four disadvantages of excessive denitrification:

1. Excessive denitrification reduces soil fertility.
2. It is stimulated by waterlogging.
3. Lack of aeration.
4. Accumulation of organic matter in the soil.

(iii) What is greenhouse effect? Write the name of two important greenhouse gases.

**Ans** The term greenhouse effect refers to the phenomenon in which certain gases (called greenhouse gases) trap heat in the atmosphere. These gases act like the glass in a greenhouse, which does not allow the inner heat to escape.

Carbon dioxide, methane and nitrous oxide are important greenhouse gases.

(iv) Write down four uses of formic acid.

**Ans** Following are four uses of formic acid:

1. Used in textile dyeing
2. Leather treatment
3. Electroplating
4. Rubber manufacture

(v) Define the term biotechnology. Also write its one benefit.

**Ans** Biotechnology:

The term biotechnology is defined as "the use of living organisms in processes for the manufacture of useful products or for services."

**Benefit:**

Biotechnology is proved much beneficial in forensic medicine. The study of DNA helps in the identification of criminals.

(vi) Differentiate between pharmaceutical and addictive drugs.

**Ans** Pharmaceutical drug or medicinal drug is defined as any chemical substance used in the diagnosis, cure, treatment or prevention of disease.



Addictive drugs are those drugs which often make person dependent on them or addicted. By using such drug, the person's body becomes familiar to it and the user cannot function well without it.

(vii) What do you mean by narcotics? Write down its one use.

**Ans** Narcotics are strong pain killers, often prescribed in conjunction with other less potent pain killers (paracetamol or aspirin). These are used to relieve pain for patients with chronic diseases such as cancer.

(viii) What are sulpha drugs? Write down its one use.

**Ans** Sulpha drugs are synthetic antibiotics that contain sulfonamide group. Sulfonamides are broad spectrum bacteriostatic antibiotics. They inhibit the folic acid synthesis in bacteria. They are used to treat pneumonia and urinary tract infections.

### (Part-II)

**NOTE:** Attempt any TWO (2) questions.

**Q.5.(a) Explain osmoregulation and thermoregulation. (4)**

**Ans** Osmoregulation:

It is maintenance of the amounts of water and salts in body fluids (i.e., blood and tissue fluids). The relative amounts of water and salts in body fluids and inside cells control the processes of diffusion and osmosis, which are essential for the functioning of cells.

**Thermoregulation:**

The maintenance of internal body temperature is called thermoregulation. The enzymes of body work best at particular temperature (optimum temperature). Any change in body temperature may affect the functioning of enzymes.



(b) Write down the name and explain different components of coordinated action. (5)

**Ans** Following are the name of different components of coordinated action:

- |              |              |                 |
|--------------|--------------|-----------------|
| 1. Stimuli   | 2. Receptors | 3. Coordinators |
| 4. Effectors | 4. Response  |                 |

**1. Stimuli:**

Touch, light, etc. are factors that can bring about certain responses in living organisms. These factors are called stimuli. A stimulus can be defined as any change in environment (external and internal), which can provoke a response in organism. More examples of stimuli are heat, cold, pressure, sound waves, presence of chemicals, microbial infections, etc.

**2. Receptors:**

Stimuli are detected by special organs, tissues or cells of body. For example, sound waves are detected by ears, light is detected by eyes, chemicals in air are detected by nose and so on. The organs, tissues or cells which are specifically built to detect particular type of stimuli are called receptors.

**3. Coordinators:**

These are the organs that receive information from receptors and send messages to particular organs for proper action. In nervous coordination, brain and spinal cord are coordinators. They receive information and send messages through neurons in the form of nerve impulses. On the other hand, in chemical coordination, various endocrine glands play the role of coordinators. They receive information in the form of various chemicals and send messages by secreting particular hormones in blood.

**4. Effectors:**

These are the parts of body which receive messages from coordinators and produce particular responses. In nervous coordination, neurons carry messages from



coordinators (brain and spinal cord) to muscles and glands, which act as effectors. In chemical coordination, particular hormones carry messages from coordinators (endocrine glands) to particular target tissues, which act as effectors. For some hormones, nephrons act as effectors. Similarly, bones and liver act as effectors for many hormones.

#### **5. Response:**

On receiving the message from coordinators, the effector performs action. This action is called response. For example, pulling our hand away from something very hot and the movement of the flower of sunflower towards light are responses. Usually, nervous coordination produces immediate but short-living responses while chemical coordination produces slow but long-living responses.

**Q.6.(a) Define arthritis and describe its types. (4)**

**Ans** Arthritis:

Arthritis means "inflammations in joints". It is also very common in old age and in women. It is characterized by pain and stiffness in joints. The treatment of arthritis include pain killer and anti-inflammatory medicines. There are many types of arthritis, for example:

#### **1. Osteo-Arthritis:**

It is due to degeneration in the cartilage present at joints or due to decreased lubricant production at joints. In this arthritis, fusion of the bones at joint may occur and joints may become totally immovable.

#### **2. Rheumatoid Arthritis:**

It involves the inflammation of the membranes at joints. Its symptoms include fatigue, low-grade fever, pain and stiffness in joints.

**(b) Define germination of seed. Describe various conditions necessary for seed germination. (5)**

**Ans** For Answer see Paper 2018 (Group-I), Q.6.(b).



**Q.7.(a) Give a detailed account of urbanization. (4)**

**Ans** Urbanization:

Urbanization means growing of cities. People move from rural areas to cities in search of better jobs, education opportunities and higher standards of living. If there is rapid urban growth, the governments find it difficult to provide even the basic facilities like health, education, shelter, water, electricity, etc. Most of the migrants in cities do not find good jobs and become the part of urban poor. There is overcrowding in schools, hospitals, etc. The slum areas increase in number and people living there are at greater risk of diseases. Urbanization is a global problem and cannot be stopped but it can be managed. The current level of urbanization in Pakistan is about 32% which is not high by global standards.

A planned urbanization can solve many problems. The cities should have thick green belts in their surroundings to control pollution. The open spaces in cities should be reserved through zoning and land plans. The urban spread-out should also be controlled. Utilization of public transport instead of individual transports also proves effective way to manage urbanization.

**(b) Explain basic steps in genetic engineering. (5)**

**Ans** The important steps of genetic engineering are as follows:

**(i) Isolation of the gene of interest:**

Firstly, the genetic engineer identifies the gene of interest in the donor organism. Special enzymes like restriction endonucleases are used to cut the identified gene from the DNA of donor organism.

**(ii) Insertion of gene into vector:**

A vector is selected for the transfer of isolated gene of interest to the host cell. The vector may be plasmid (extrachromosomal DNA present in many bacteria) or a bacteriophage. The gene of interest is attached with the vector DNA by using endonuclease (breaking enzyme)



and ligase (joining enzyme). The vector DNA and the attached gene of interest are collectively called as recombinant DNA.

- (iii) Then the recombinant DNA is transferred to a target host cell. In this way, the host organism is changed into genetically modified organism (GMO).
- (iv) Then a suitable culture medium is provided to GMO for growth to give as much copies of the gene of interest as needed.
- (v) The GMO contains the gene of interest and manufactures the desired product. Then this product is isolated from culture medium.

